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Air Force research bears torch of its own at Winter Olympics

by Capt. Jeff Sandrock, AFMC Public Affairs

SALT LAKE CITY, Utah — A six-member team of Air Force people and contractors made the 1,700-mile crossing from Wright-Patterson Air Force Base to the 2002 Winter Games to showcase part of its cutting-edge technology to the world.

The team trucked in and assembled a marvel of engineering called the WB-4, which stands for Whole Body Scanner, with four instrument packs.

Looking like something out of Star Wars, the scanner consists of two towers supporting four television-sized instrument heads and a central raised platform where the subject stands to be scanned.

"It scans the body and makes a three-dimensional image on the computer screen, and we can extract any number of measurements from that image," said Scott Fleming, the Olympic visit project leader and technician from Sytronics, Inc.

As the subject is scanned, a mechanism lowers the four sensor heads from its ten-foot height down to the ground, using photo, laser and infrared instruments to create an electronic rendition of the subject on a nearby computer.

"The Air Force uses it as a measuring tool to redesign cockpits, pilot seats, G-suits, helmets and oxygen masks," said Fleming.

Visitors in the Air Force scanner tent were invited to listen to a brief description of the device and its purpose, then to step up on the platform to be scanned.

Then, after having any questions answered, they walked away with a full-color printout of their scan, a three-dimensional image of themselves with the Olympic and



SCANTARCTICA: Sea World San Diego's Supervisor of Birds Lauren Dubois and Magellanic Penguin Pete stand motionless for a scan at the Bud World Party, where AFRL's WB-4 Whole Body Scanner was displayed. (Air Force Photo by 2nd Lt. Morgan J. O'Brien III)

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Commander

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<http://extra.afrl.af.mil/news/index.htm>

AFRL's robot hobbyists compete on BattleBots

by *Ranney Adams, Propulsion Directorate*

EDWARDS AFB, Calif. — Warriors come in many shapes, sizes, and even scientific disciplines. The lucky ones get to choose the size of their adversary and even the time of battle.

This is the case for six Air Force Research Laboratory employees from the Edwards Research Site's Propulsion Directorate. These robot hobbyists and three teammates that work at NASA-Dryden Flight Research Center competed at the latest BattleBots Tournament near San Francisco. BattleBots is a robotic combat sport whose competitions are broadcast on the "Comedy Central Presents BattleBots" TV series. The results of this latest tournament started airing in January.

Named the X-Plane Refugees, the team includes AFRL members: Lester Knox, George Harting, Gregory Ruderman, Adams Irvine, Steven Bremer, and Steven Hanna. The NASA contingent includes David Granica, Ryan Dibley, and Trevor Foster, a senior at CalPoly-San Luis Obispo.

These rocket scientists and engineers had turned their adult hobby interest into a quest for top prizes against seasoned veterans of earlier BattleBot battles, applying the same preparations they use when pursuing rocket propulsion or flight research.

Their plan was to compete with three different homemade, radio-controlled robots that were not something you would like to meet in a foreign cave, tunnel, or competition arena. The first, named 'TDM', was a lightweight spinner-style robot with weapons that would cause any adversary to run in the opposite direction. A middleweight tank-style robot named 'Space Monkey' comes equipped with two 10,000-rpm spinning blade weapons. Its heavy-weight brother, with a similar design, is named 'Space Ape'.

On the last day of competition the X-Plane Refugees team had reached the top 16 contenders in the middleweight division with Space Monkey. Remote control driver Dibley of NASA-Dryden was ready for the Space Monkey's fifth combat of the week. Each of its prior bouts had required many sleepless hours of effort for repairs and modification by the team.

To match more experienced drivers, gain points from the judges, and win the attention of the audience, Dibley emphasized that, "We have to be aggressive.....**Review remainder of this story in the Features section of the online newsletter.**

Find additional Features on the web

AFRL Reservists mobilize for Operation Noble Eagle

Commander addresses future Air Force leaders

ML Chief Scientist caps 38-year Air Force career

Air Force continues tradition of science fair program

by Katherine Gleason, AFRL Public Affairs

WRIGHT-PATTERSON AFB, Ohio — More than one million junior and senior high school students are hard at work on the projects that might give them the opportunity to compete in the International Science and Engineering Fair this May in Louisville, Ky. While only a handful will emerge as winners, every participant should know that they share something in common with the commander of the Air Force Research Laboratory.

In 1968, AFRL Commander Maj. Gen. Paul D. Nielsen was a high school senior in Louisiana. His science fair project was a regional winner, and afforded him the opportunity to compete in the Louisiana State Science Fair. For Nielsen, this was just the beginning of a life-long interest in the areas of math and science.

"I've enjoyed my career as an Air Force scientist, and now I have the great fortune of heading the entire Air Force science and technology program," said Nielsen.

Realizing the importance of reaching out to promising young scientists, the Air Force is actively involved in science fairs. The Air Force, along with the Army and Navy, support approximately 350 regional fairs in the United States and Puerto Rico each Feb-

ruary through April and presents more than 1,400 awards annually.

The goal of the Air Force Science Program is threefold. First, the program seeks to demonstrate Air Force interest in youth to parents, teachers, and the community. The second goal is the recognition and encouragement of students who are conducting research in areas of interest to the Air Force. Third, the Air Force wishes to acquaint students with career possibilities by providing Air Force visibility to tomorrow's scientists and engineers.

"The program offers a unique opportunity for both military and civilian personnel to develop young minds and make a lasting, positive impression in the community," said Air Force Science Fair Program Manager Sue Sobieski.

Air Force support at the regional level began in 1994. AFRL manages this program with extensive involvement from the Air Force Recruiting Service. As the mainstay of the regional program, the Air Force Recruiting Service, through the squadron commanders, works to match recruiters to fairs in their area.

For more information on the Air Force Science Fair Program, contact Sobieski at Susan.Sobieski@afrl.af.mil, or at 937/656-9875. @

Body scanner (from page 1)

Air Force logos as a souvenir.

With security as the primary concern at the Olympics, many visitors asked about its use as a security device.

"This scanner is like a camera, except it takes pictures in three dimensions instead of just two. It can't see through clothing," said Fleming.

The hope of scanning subjects in top physical form also drew the team here to Salt Lake City.

"We hope to scan the Olympic athletes, and add their information into our database," Fleming said. "We have already had several visit us to be scanned."

Having recently completed a four-year study and accumulating more than 12,000 scans, the team has had its share of globe-trotting.

"We traveled all around the U.S. to twelve different sites, and two sites in Europe to gather scans of everyday, normal people," explained Fleming as he spoke to a group of visitors.

The benefactors of this lengthy study, aside from the Air Force, are the automotive, apparel and airline industries.

"The information we provide will allow them to redesign car seats, airline seats, clothing, work stations, chairs, tables, basically everything that people use," said Fleming.

Visitors' reactions ranged from awe to excitement.

"I think it's amazing, the level of detail it can pick up with just one pass," said Jason Fagenbush, a Medical Sergeant and Emergency Medical Technician assigned downtown for the duration of the Olympics. "It's neat to see a three-dimensional figure of your body."

"It's awesome," said Derek Hansen, eleven, after seeing the scanner up close with his family.

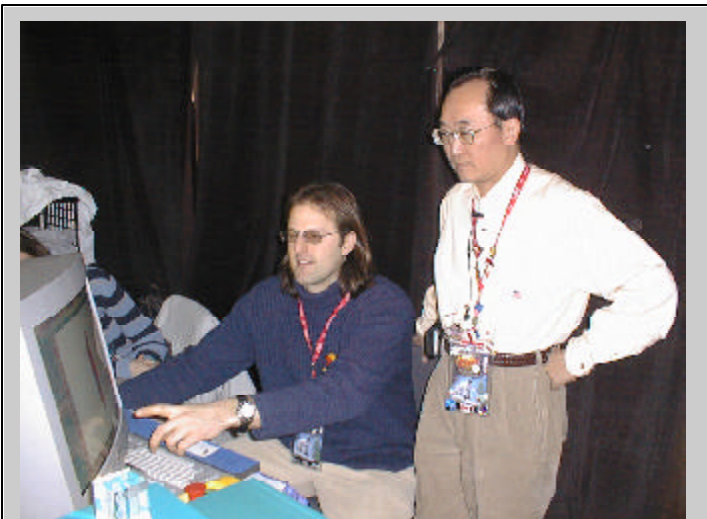
"I like the clothing aspect, because I'm petite, and things generally don't fit exactly right, so I'm excited about that," said Lynette Simmons, a staff member in the Olympic media operations center.

"I wonder what it's going to be like in five or ten years, when

the technology gets twice as good, or ten times better," said Simmons.

Having conducted several hundred scans each day since opening ceremonies, the booth is estimated to reach as many as 15,000 visitors by the time the Olympics are finished.

Cyberware, Inc., built the scanner under Air Force contract, and the scanner is operated by contractors, who are engineers with Sytronics, Inc. @



GET THE PICTURE? — Project team leader Scott Fleming points out the details of the image created by the WB-4 scanner to Wei-Cheng Chen, president of Version Timeless Sculptures, whose display tent neighbored the Air Force's scanner tent at the Salt Lake 2002 Winter Games.

AFRL HQ Plans and Program Director will retire March 1

by Jill Bohn, AFRL Public Affairs

WRIGHT-PATTERSON AFB, Ohio — When asked to describe his job in just a few short words, Air Force Research Laboratory Plans and Program Director Terry Neighbor responded, “We fight a lot of forest fires, sometimes brush fires.”

Based upon that notion, AFRL will lose its chief fire fighter on March 1, when Neighbor joins the ranks of retirement, taking with him 32 years of civilian Air Force service.

Neighbor, who received a Bachelor of Science degree in aerospace engineering from the University of Cincinnati in 1966, and a master’s degree from Ohio State University in 1970, began his engineering career as a stability and control engineer for North American Aviation, Columbus, Ohio.

“My ambition as a kid was to discover something that would be really important - it didn’t matter what,” he said of his career early on. “I like the satisfaction of being able to discover things.”

Neighbor has served as the Director of the Plans and Program Directorate since 1998. His career at WPAFB began in 1970, where he was a flying and handling quality engineer for the Flight Dynamics Laboratory, Wright Laboratory until 1982. From 1982-1987, he was chief of the Control Applications Group, Flight Dynamics Laboratory, Wright Laboratory. He served as deputy program element manager, Advanced Development Integration and Transition Office, Flight Dynamics Directorate, Wright Laboratory from 1987-1990. From 1990-1993, he was chief of the Technology Strategy Branch, Flight Dynamics Directorate, Wright Laboratory.

In 1993, he was deputy division chief of the Aeromechanics Division, Flight Dynamics Directorate, Wright Laboratory. From 1993-1997, he served as chief of the Investment Strategy Division, and later, as director of the Plans Directorate for the Wright Laboratory. He served as acting director of AFRL’s Air Vehicles Directorate from 1997-1998.

One of the biggest issues the lab faces, according to Neighbor, is not a budget issue by itself, but getting people to understand the significance of science and technology research. He explained how investments made now would pay off for the Air Force over the long-term picture, yet generally people want to see immediate changes.

“We have a lot of good people right now doing good work,” he said. “If you want to push the frontier, you’ve got to allow the people to think outside of the box.”

Specifically, he mentioned heat-seeking pit viper research. The snake’s eye harbors a heat-sensing system so sensitive that the snake can detect its prey from far away, and in complete darkness.

The Air Force wants to see if they can mimic the biological system and get a better detector. Researchers hope that when they unravel the secrets of the viper’s search and discover the mechanism, that the principles may be applied on a much larger scale to protect the nation from enemy missiles, and to help pilots flying dangerous missions evade enemy weaponry.

By looking to biotechnology, nanotechnology and information technology, the laboratory will have the revolutionary mix it needs to succeed in the science and technology field, said Neighbor.

While Neighbor said he sees the need to push the envelope when it comes to scientific breakthroughs, he also claimed to be a proponent of balance.

“It’s important to have one group that will invest in the near-term, while another group pushes the boundary. Balance is an absolutely critical challenge to this office,” he said.

For his entire career, Neighbor chose to surround himself in an environment of people who share his passion for science and technology.

“The Air Force Research Laboratory offers opportunities to get researchers so

much more involved, so much earlier,” he said of the workforce. “That’s how you capture good people. That’s how you keep people.”

“And by bringing in these top talents, we can prove to our customers that we are a valuable asset to them,” Neighbor said. And it’s that type of dedicated worker that he said he’d miss most about his job.

“Terry is one of the best examples of the quality of a total force,” said Maj. Gen. Paul D. Nielsen, Commander, Air Force Research Laboratory. “In this tough, demanding job, he has always put service before self. AFRL and the Air Force are better prepared for the 21st century due to Terry’s strong personal and organizational contributions.”

Post retirement, Neighbor said he plans to divide up his free time two ways. First on the list is his grandkids - three to be exact, and one on the way. Second, is his golf game. At press time, he seemed to be working out a plan that might allow him to combine his love for both. Long term, he said he might consider either consulting or volunteer work.

Neighbor said he feels he should give some of his free time to Miami Valley Hospital after he spent several weeks there in 1985 while suffering from Guillain-Barre syndrome.

“I spent those weeks in Miami Valley Hospital and those folks were extremely nice to me, so I think I owe them some of my time,” he said.

Other leisurely aspirations may include a return to the soccer field. A former coach of the sport for 14 years, Neighbor said, “I might come out of retirement,” to continue coach.

“Coaching soccer is a lot like management, he said. “You give them the basics they need and then watch them expand and grow.”

“It’s so rewarding to leave to take on new responsibilities, and being able to feel confident that you have the right people on board so that you can walk out the door.”

A retirement ceremony for Neighbor will be held at 9 a.m. on March 1 at the United States Air Force Museum, Modern Flight Hangar. @



Terry Neighbor

ML says that ManTech process saves millions of dollars

by Gary Cunningham, Materials and Manufacturing Directorate

WRIGHT-PATTERSON AFB, Ohio – A manufacturing process improvement for the composite body of the Joint Air-to-Surface Stand-off Missile (JASSM), will save more than \$19 million over the production life of the missile, according to representatives of the Manufacturing Technology (ManTech) Division of the Air Force Research Laboratory's Materials and Manufacturing Directorate.

The ManTech-led cooperative effort, officially called the JASSM Composite Body Rapid Response Process Improvement (R²PI) program, included representatives of Lockheed Martin Corporation and Fiber Innovations, Inc. (FII).

JASSM is a joint Air Force-Navy program developed and produced by Lockheed-Martin Integrated Systems. It employs stealth to penetrate enemy air defenses at ranges of more than 200 miles, and can be launched off most types of aircraft in the Air Force inventory. JASSM is designed to destroy high-value, well-defended, fixed and moving targets.

Most of the surface area and load bearing structure of each JASSM is manufactured using a braided composite process to place fibers in their proper orientation and shape. The majority of these parts are then molded using the Vacuum-assisted Resin Transfer Molding, or VaRTM, process.

A costly, hands-on trimming procedure was required after the VaRTM process, however. This led to ManTech approving a plan for Lockheed-Martin, in conjunction with FII, to develop the JASSM Composite Missile Body R²PI Program. By eliminating the post-VaRTM trimming steps, R²PI would succeed in reducing the manu-

facturing risk to cost and schedule goals for JASSM by improving the manufacturing process. Cost and schedule goals are associated with reducing manufacturing hours, cycle time, scrap and rework.

This was accomplished through R²PI by developing net-shaped preforms for fuselage components, and improving the net edge molding of the upper and lower composite fuselage by improving the inner mold line dimensional control and optimizing the resin infusion through automated temperature and pressure controls.

Results of the ManTech-led R²PI program exceeded expectations. The cost savings of \$19 million over the life of the JASSM production helped bring the program in below its objective cost of \$400,000 each (FY95 dollars). Making the JASSM more affordable led to high praise from Department of Defense and Air Force leadership.

According to an Air Force News release, Undersecretary of Defense Pete Aldridge gave the JASSM program the go ahead for low rate initial production on Dec. 21, 2001. This prompted Secretary of the Air Force, Dr. James G. Roche, to state, "JASSM is a flagship program for acquisition excellence. Not only do our combat forces get an unprecedented precision attack capability, but they get it at an affordable price never before achieved on a cruise missile program."

The Air Force plans to make the decision for full rate production in late 2003. @

Eastman Kodak awarded hyperspectral research contract

by Fran Crumb, Information Directorate

ROME, N.Y.— The Air Force Research Laboratory Information Directorate has awarded a \$883,840 contract to Eastman Kodak Co. of Rochester for research in the field of hyperspectral imaging.

The three-year agreement, "Hyperspectral Information Fusion," will produce software to fuse hyperspectral information with other types of intelligence data.

Hyperspectral imagery consists of hundreds of "spectra," or measurements of reflected or emitted energy. All objects reflect or emit a certain amount of electromagnetic energy. The intensity of this energy can be measured at various wavelengths. Many objects and substances have spectral characteristics that are unique. A unique spectral "signature" allows that object or substance to be identified

through various spectral analyses.

"By using sensors to detect multiple wavelengths, it is possible to differentiate between natural and manmade objects - even different kinds of vegetation and various types of building materials," said Brian C. Romano, program manager in the directorate's Information and Intelligence Exploitation Division.

"Hyperspectral imaging is a relatively new technology that has significantly improved the capability for remote sensing of the Earth's surface," said Romano. "In addition to potential military applications, hyperspectral technology is expected to open new frontiers in biomedical imaging and remote sensing for environmental studies." @

HE Mesa stages Warfighter Readiness Training



MESA, Ariz.— F-16 pilots fill out paper surveys in preparation for the Pathfinder research tool program loaded on AFRL/HEA laptop computers at the Mesa Research Site, Ariz. Pilots are administered Pathfinder prior to their first Distributed Mission Training (DMT) sortie and after their last simulator sortie of the week. AFRL/HEA scientists use this data, along with data captured during DMT engagements, to analyze warfighter readiness training effectiveness enabled by a high-fidelity multi-ship synthetic combat environment. (Air Force photo) @

Net Index

Due to the number of submissions we receive, some sections of *news@afrl* are available exclusively on-line. The on-line version of the newsletter allows users to view the AFRL corporate calendar, news releases generated by AFRL headquarters, operating instructions, L@b L@urels and Roundups sections.

The L@b L@urels section of the electronic newsletter is dedicated to members of Air Force Research Laboratory who receive awards and honors. The Roundups section of the electronic newsletter keeps Air Force Research laboratory employees informed about contracts AFRL has awarded. Below is an index of articles one can find in each of these on-line sections.

L@b L@urels

**Stay tuned for the
March edition
featuring...**

- DE's Public Affairs Office earns Director's Excellence Award

- AFOSR's Col. Cervený honored with Silver Cross

- International magazine recognizes Gen. Nielsen for role in summit

2001 AFRL Annual Banquet

Rome Lab Design Near Completion

*For more on these stories see news@afrl
<http://extra.afrl.af.mil/news/index.htm>*

AF Vice Chief of Staff visits Munitions Directorate



MN BRIEFING — Gen. Robert Foglesong, Vice Chief of Staff of the Air Force (left), receives a briefing on the Small Smart Bomb with the Range Extension Wing kit from Mickey Duvall (center), leader of the SSB Advanced Programs Team, while Col. Tom Masiello (right), MN Director, looks on. The general visited Eglin's AFRL Munitions Directorate January 18, 2002. (Air Force photo by Rick Walker) @

To view the full text of these and other articles visit the *news@afrl* page on the Internet at <http://extra.afrl.af.mil/news/index.htm>.

To submit L@b L@urels or Roundups from your directorate, send a query to AFRL Public Affairs at:

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